HIToolbox: New Controls and Services

Session 206

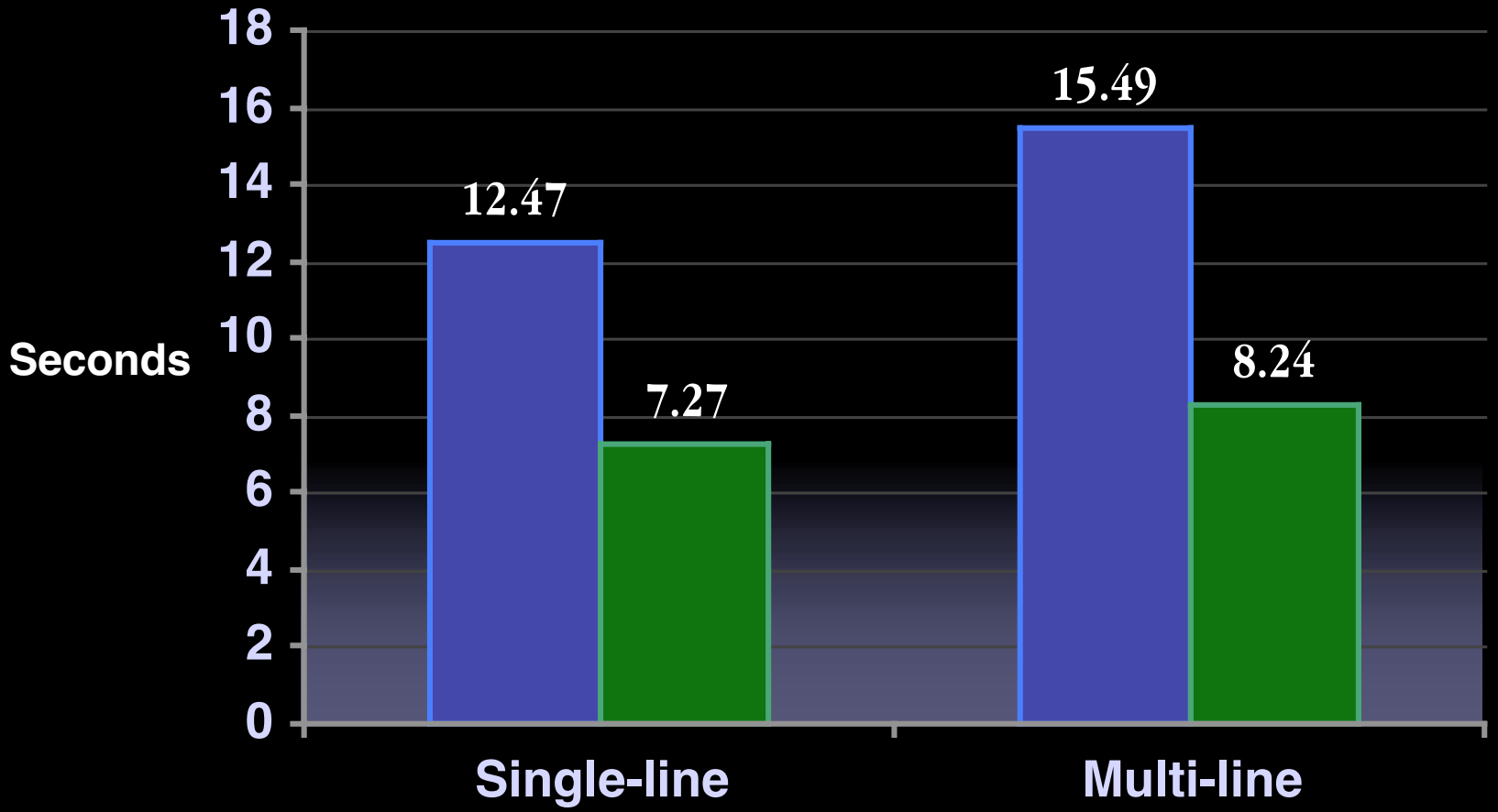
HIToolbox: New Controls and Services

Guy Fullerton
HIToolbox Engineer and Demo Model

Agenda

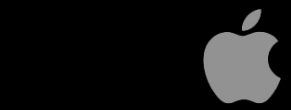
- New Appearance Manager
- New Controls
- Drawers
- Services Menu Integration
- Improved Keyboard Navigation

Theme Text Speed



Appearance Manager

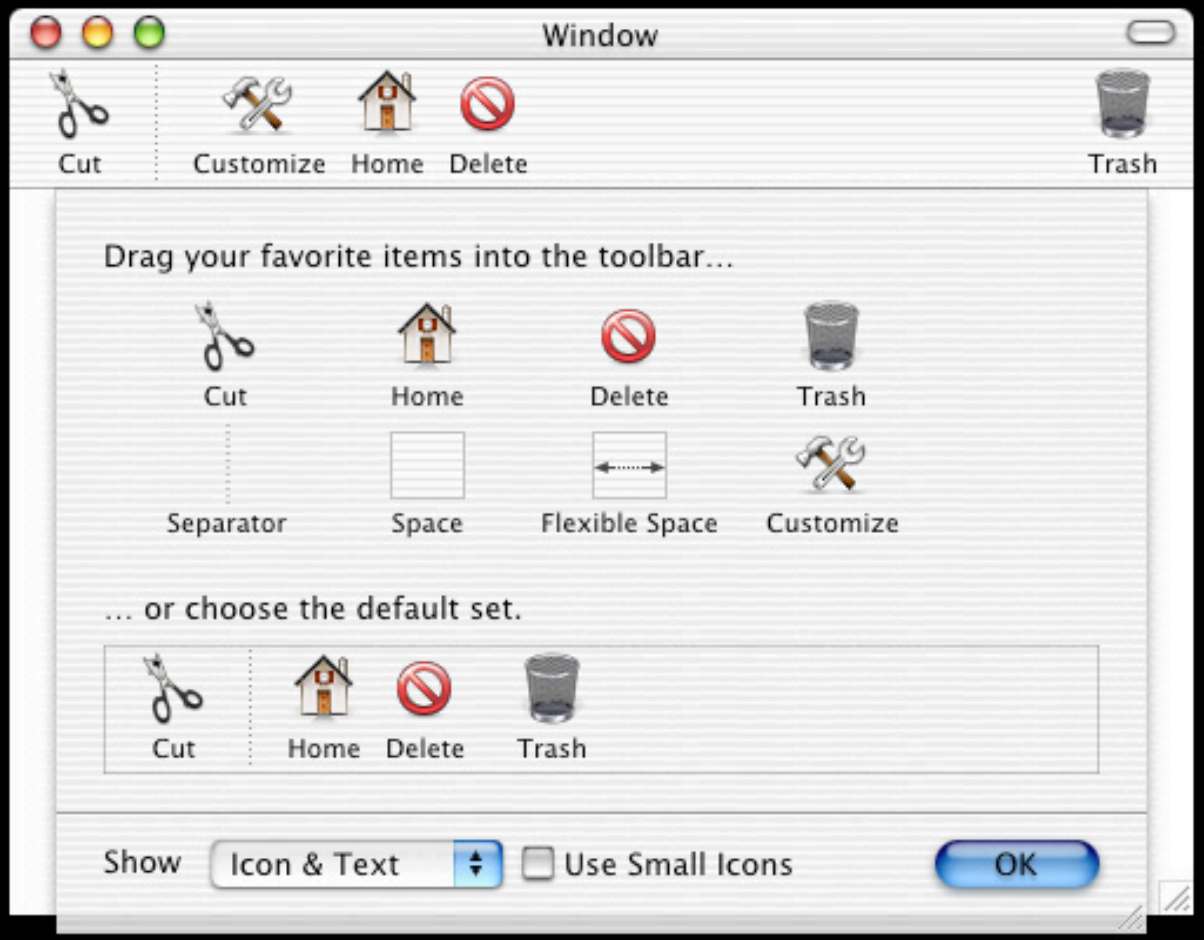
- Inefficient QD to CG synching
- 16-bit integer coordinates
- Need to use ThemeEraseUPPs



New Appearance Manager APIs

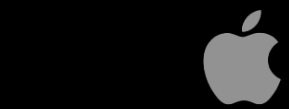
- CG native drawing
- Floating point coordinates
  - HIRect and HIPoint
- No more ThemeEraseUPPs

Toolbar Control



Toolbar Features

- User interaction
- Configuration sheet
- Drag and drop
- Removal animation
- Contextual menus
- Auto save
- Fully configurable and customizable



Toolbar Object

- HIToolbar.h
- Model-View-Controller architecture
    - Toolbar instance is not a view
- Toolbar item views must be HIViews

Creating a Toolbar

```
HIToolbarRef        myToolbar;

HIToolbarCreate( CFSTR( “com.myco.mytoolbar” ),
    kHIToolbarAutoSavesConfig |
        kHIToolbarIsConfigurable,
    &myToolbar );

HIToolbarSetDelegate( myToolbar, myDelegate );
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Creating a Toolbar

```
SetWindowToolbar( docWindow, myToolbar );

ChangeWindowAttributes( docWindow,
    kWindowToolbarButtonAttribute, 0 );

SetAutomaticControlDragTrackingEnabledForWindow(
    docWindow, true );

ShowHideWindowToolbar( docWindow, true, false );

CFRelease( myToolbar );
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Toolbar Delegate

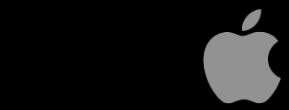
- HIToolbarSetDelegate
- Can be any HIObject
- The “Boss” of a Toolbar
    - Defines default toolbar items
    - Defines allowable toolbar items
    - Creates toolbar items
- Allows laziness/efficiency

Toolbar Delegate Events

- kEventToolbarGetDefaultIdentifiers and kEventToolbarGetAllowedIdentifiers
    - Pass back a list of item identifiers
- kEventToolbarCreateItemWithIdentifier and kEventToolbarCreateItemFromDrag
    - Pass back an HIToolbarItemRef

HIToolbarItem

- Has an identifier, label, image, and command ID
- Acts as a push button
    - Command ID sent when pressed
- Submenu attachment
- Attribute bits
- Behaviors are changeable



HIToolbarItem Attributes

- Allow duplicates
- Cannot remove
- Anchored to the left side
- Is separator
- Send Command ID to User Focus

Standard Toolbar Items

- Space
- Flexible space
- Separator
- Configuration button
- Each has a corresponding identifier

Creating Toolbar Items

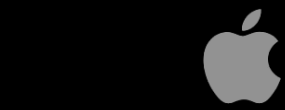
```
HIToolbarItemRef            mySortItem;

HIToolbarItemCreate(
    CFSTR( “com.myco.sort” ),
    kHIToolbarItemSendCommandToUserFocus,
    &mySortItem );

HIToolbarItemSetCommandID( mySortItem,
    kMySortCommandID );

HIToolbarItemSetLabel( mySortItem, CFSTR( “Sort” ) );

HIToolbarItemSetImage( mySortItem, mySortImage );
```



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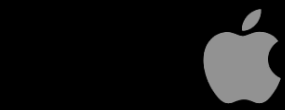

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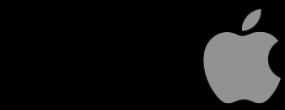

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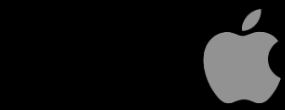

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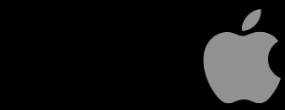

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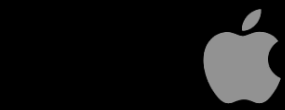


Custom Toolbar Items

- Can represent more than Icon and Label
- Subclass HIToolbarItem
    - Add new data and behaviors
- kEventToolbarItemCreateCustomView
    - Lets your Item create a View

Custom Toolbar Item Views

- Must be an HIView
- Must support kEventControlGetSizeConstraints
    - Apple's views do not support this yet

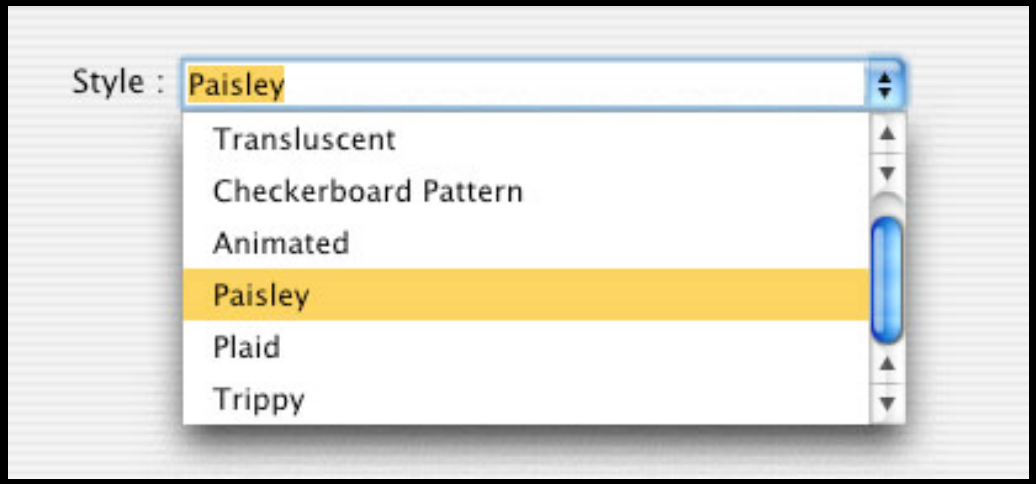
Managing Toolbar Items

- Toolbar can handle this for you, or:
  - HIToolbarAppendItem
  - HIToolbarInsertItemAtIndex
  - HIToolbarRemoveItemAtIndex

Windows Listen To . . .

- kHICommandConfigureToolbar
- kHICommandHideToolbar
- kHICommandShowToolbar

Combo Box


Style :
Paisley
Transluscent
Checkerboard Pattern
Animated
Paisley
Plaid
Trippy

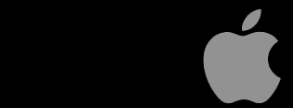
HIComboBoxCreate

- Default text for the edit field
- Array of items to populate the list
- Attributes
- Windowless creation

Scroll View

Scroll View (Cont.)

- HIScrollViewCreate
- Manages offset-based scrolling of a “canvas”
- Vertical and horizontal scroll bars
- HIViewAddSubview
    - Connects the “canvas” to the Scroll View



View on a Canvas

Scroll View Protocol

- kEventScrollableGetInfo
  - What are your “canvas” dimensions?
  - Where are you scrolled to right now?
  - What is your line height size?
  - What is your view size?
- kEventScrollableScrollTo
  - Move now!

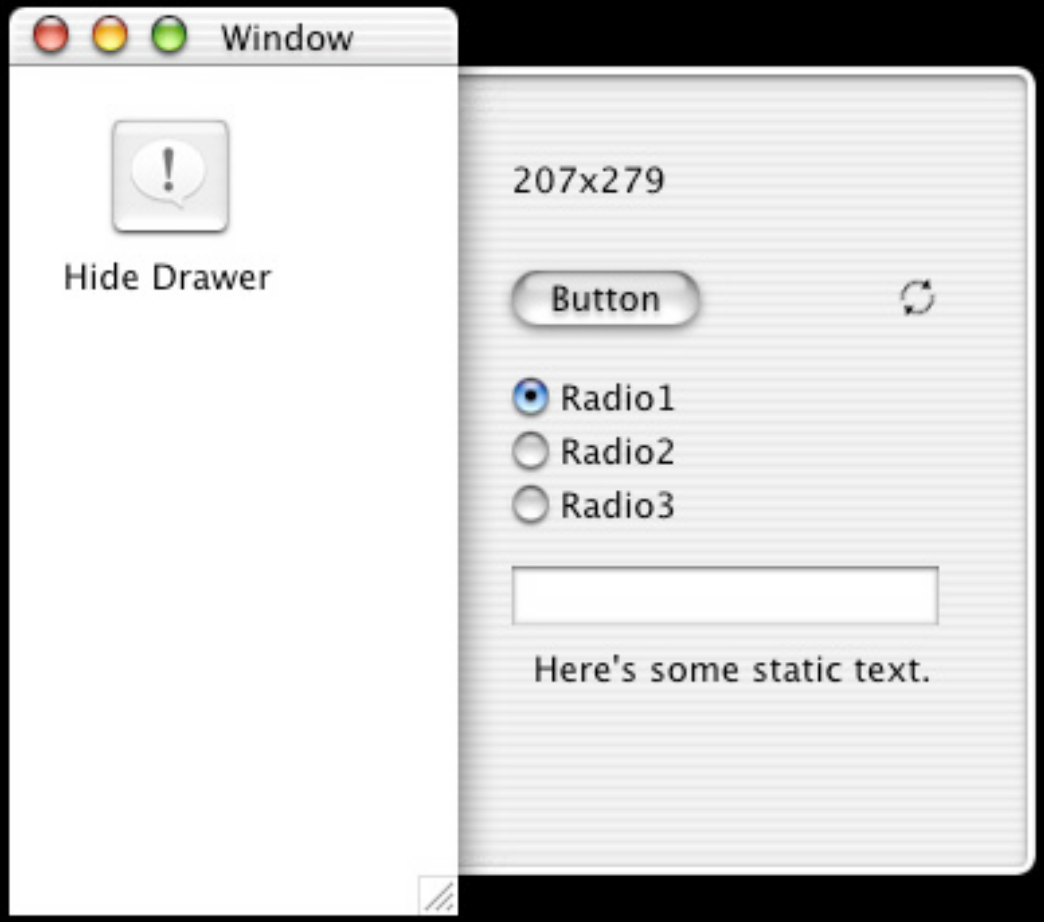
HIViewScrollRect

- Efficient Scrolling API
- Does a fast blit when possible
- Invalidates as necessary

Scroll View Protocol

- kEventScrollableInfoChanged
  - I have changed!
  - Not implemented in WWDC Jaguar seed

Drawers


Window
Hide Drawer
207x279
Button
Radio1
Radio2
Radio3
Here's some static text.

Drawer Creation

```
CreateNewWindow( kDrawerWindowClass,
    kWindowResizableAttribute |
        kWindowStandardHandlerAttribute,
    &bounds, &myDrawerWindow );

SetThemeWindowBackground( myDrawerWindow,
    kThemeBrushDrawerBackground, false );

SetDrawerParent( myDrawerWindow,
    myDocumentWindow );
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SetDrawerParent( myDrawerWindow,
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```
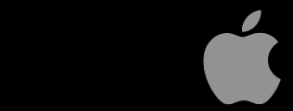

Drawer Configuration

- SetDrawerPreferredEdge()
- SetDrawerOffsets()
- SetWindowResizeLimits()
    - Or kEventWindowGetMinimumSize and kEventWindowGetMaximumSize

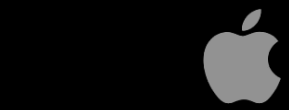


Drawer Event Handling

- Standard Window Handler is preferred
- WaitNextEvent works, too
- kEventWindowDrawContent is required
    - Except when compositing (with HIView)

Drawer Management

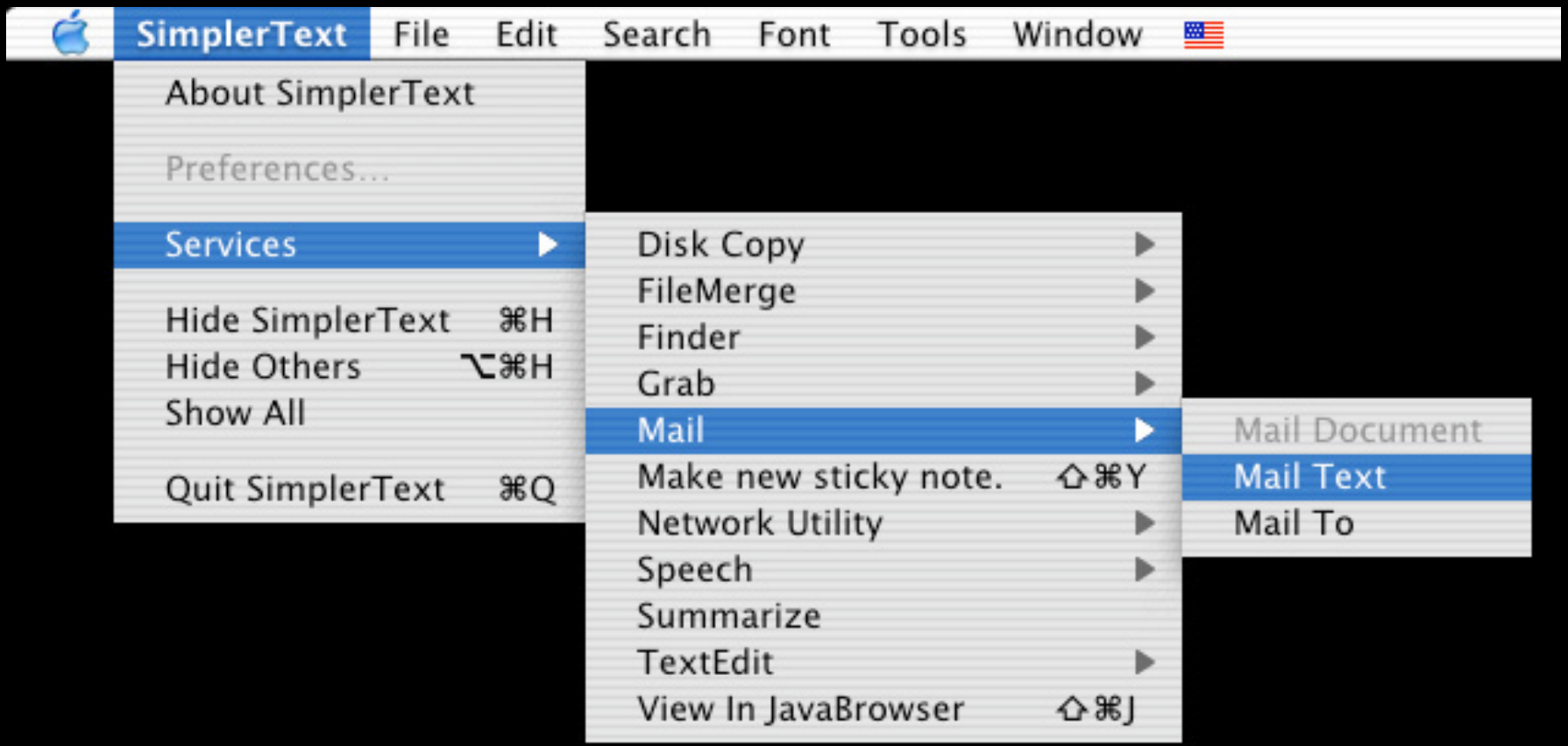
- ToggleDrawer()
  - Easiest to use
  - Asynchronous
- OpenDrawer() and CloseDrawer()
  - Maximum configurability



Drawer Events

- kEventWindowDrawerOpening
    - Sent before opening
- kEventWindowDrawerOpened
    - Set after drawer has finished opening
- kEventWindowDrawerClosing
- kEventWindowDrawerClosed

Services


SimplerText
File
Edit
Search
Font
Tools
Window
About SimplerText
Preferences...
Services
Hide SimplerText ⌘H
Hide Others ⌥⌘H
Show All
Quit SimplerText ⌘Q
Disk Copy
FileMerge
Finder
Grab
Mail
Make new sticky note. ⇧⌘Y
Network Utility
Speech
Summarize
TextEdit
View In JavaBrowser ⇧⌘J
Mail Document
Mail Text
Mail To

Service Clients

- kEventServiceGetTypes
  - What flavors can you give right now?
  - What flavors can you receive right now?
  - Use CreateTypeStringWithOSType()
- kEventServiceCopy
  - Selection → ScrapRef
- kEventServicePaste
  - ScrapRef → Selection

Service Providers

- Report information in your Info.plist
- Must have a CFBundleIdentifier
- NSServices key describes your services
    - Message identifier
    - Menu item text
    - Send types
    - Return types

Service Providers (Cont.)

- Put your app in the right place
  - /Applications/
  - /Network/Applications/
  - /System/Library/Services/

Service Providers (Cont.)

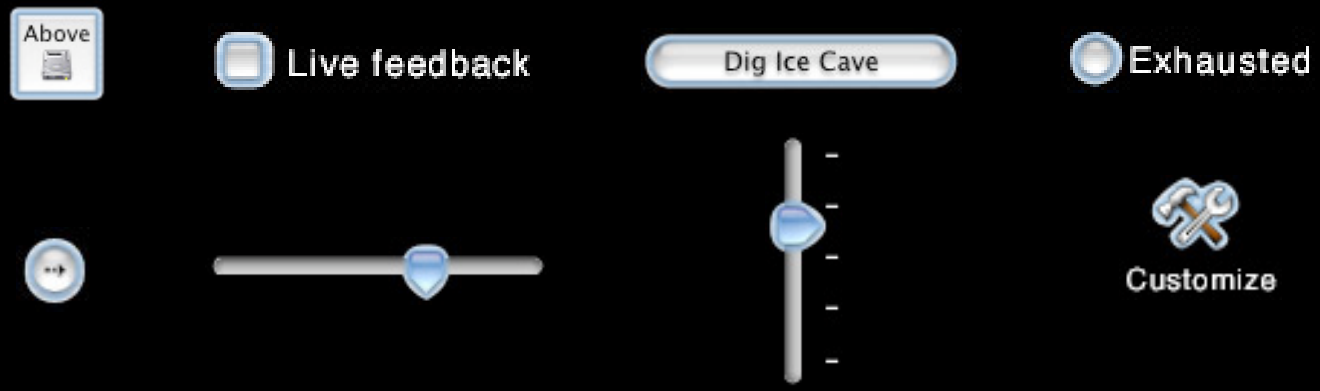
- kEventServicePerform
  - Message identifier
  - ScrapRef
- Your Service does its work
  - Operate on the data in the ScrapRef
  - Modify the ScrapRef as desired
    - Do not forget to ClearScrap!

Services Documentation

- Already shipped in 10.1
- Header doc in CarbonEvents.h
- Online documentation:

  developer.apple.com/techpubs/macosx/Carbon/HumanInterfaceToolbox/MenuManager/appservices/index.html

Keyboard Navigation

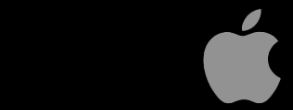


Keyboard Navigation (Cont.)

- Section 508 Compliance
- Highly requested user feature
- Using the keyboard, you can:
    - Navigate the menu bar
    - Switch between windows
    - Interact with (virtually) all controls

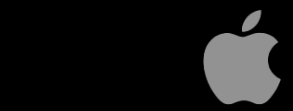
Menu Keyboard Navigation

- Generally free
- Custom Menu Definitions require some effort



Window Keyboard Navigation

- Window-switching behavior is done for you
- Customizable:
  - kEventAppFocusNextDocumentWindow
  - kEventAppFocusNextFloatingWindow



Toolbar ↔ Content Navigation

- kEventWindowFocusToolbar
  - Move focus to the Toolbar of your Window
- kEventWindowFocusContent
  - Move focus to the content of your Window
- Automatically handled!
- Override the behavior for custom app content

Control Keyboard Navigation

- Traditional
    - Only Edit Text, Clock, List View
- “Full Keyboard Navigation”
    - Push Buttons, Check Boxes, Popup Buttons
    - Virtually all controls
- Setting Toggles
    - System Preferences—permanent
    - Hot Key (Control–F7)—transient

Custom Control Keyboard Nav (Cont.)

- kEventControlSetFocusPart
  - Now has a “focus everything” parameter
- Traditionally focusable controls
  - Behave as you always have
- Other controls
  - Only focus when “focus everything” = true

Custom Control Keyboard Nav (Cont.)

- Listen to appropriate keyboard events
  - kEventKeyboardRawKeyDown
- React to appropriate keys
  - HIViewSimulateClick

Customizing the Focus Order

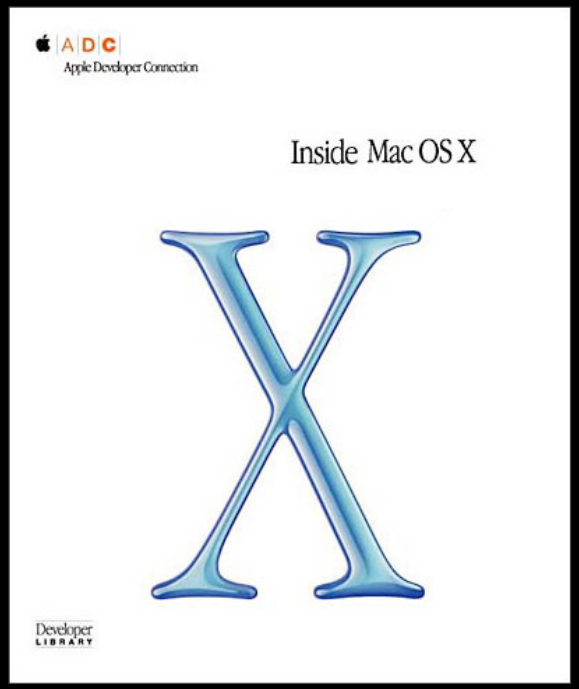
- Carbon Events:
  - Parent View decides Subview focus order
  - kEventControlGetNextFocusCandidate
- APIs:
  - HIViewSetNextFocusView
  - HIViewSetFirstFocusSubview

Adopt the New Features!

- Make users lives better
- Reduces developer effort
- Be the best Applications in Aqua
- Star Wars Episode II comes out next week!
    - Code while you wait in line

Documentation

HIToolbox



- HIObject Reference (Prelim)
- HIView Reference (Prelim)
- HIToolbar Reference (Prelim)

ADC Member Site > Download Software > “Jaguar” Mac OS X
connect.apple.com

Roadmap

204 HIToolbox: An Architectural Overview	Hall 2 **Wed., 9:00am**
205 HIToolbox: Introducing HIView	Hall 2 **Wed., 10:30am**
203 Migrating to Carbon Events	Hall 2 **Tue., 5:00pm**
207 Improving Performance With Carbon Events	Hall 2 **Wed., 3:30pm**
209 Accessibility and Carbon	Room A2 **Thurs., 3:30pm**

Who to Contact

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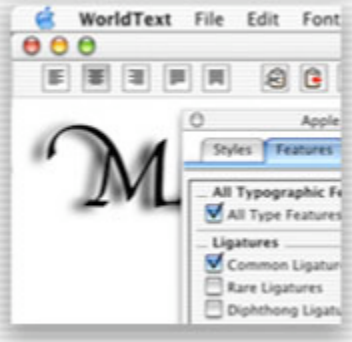
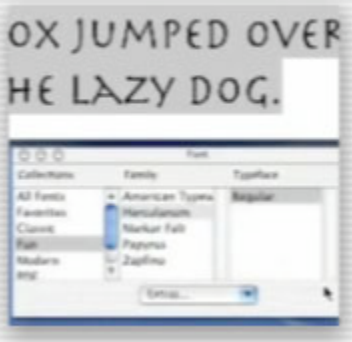
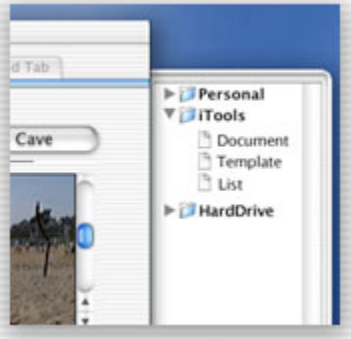
Apple Worldwide Developer Relations
xavier@apple.com

http://developer.apple.com/wwdc2002/urls.html

Q&A







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http://developer.apple.com/wwdc2002/urls.html


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